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ABSTRACT

The paper reviews literature relating to selective attention in the learning disabled child. Three processes related to the concept of selective attention (as proposed by D. Berlyne) are discussed: attention in learning, attention in remembering, and attention in performance. It is pointed out that verbal mediation, the use of verbal labels to indicate the relationship between the stimulus and the desired response, is a technique which has proven to be effective in enhancing both selective attention and memory in older students. The question of whether there is a difference in the use of effective discrimination in good and poor readers is answered in part by citing research showing that children trained in selective attention exhibited marked progress in reading achievement. The developmental aspect of selective attention is also considered. A. Ross contends that learning disabled children develop selective attention more slowly than others and so are handicapped in learning. Among the strategies described for facilitating selective attention are task analysis, utilization of conditions to stimulate heightened attention, verbal rehearsal strategies, exaggeration of the differences between relevant and irrelevant stimuli, addition of a motor response commensurate with the stimulus, and the use of extrinsic reinforcers. (SB)

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SELECTIVE ATTENTION IN THE LEARNING DISABLED CHILD

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SELECTIVE ATTENTION IN THE LEARNING DISABLED CHILD

"All eyes this way!"

"I need everyone's attention!"

"Now that I have your attention, we may begin."

These admonitions are heard daily in classrooms throughout the country and across all grade lines, for educators readily agree that, without attention to the concept or task at hand, there can be no learning. Some assumptions regarding attention have been made, however, which merit evaluation. Is it necessarily true that a child who is gazing out of the window is inattentive to the discussion in the classroom? Can it be assumed that attention is heightened when, at the request of the teacher, the student turns from the window and looks at the instructor? Can the child with learning problems be expected to attend with the same accuracy as the average achiever without teaching techniques designed to accomodate special needs? This paper will address these and other related questions in looking at selective attention and the learning disabled child.

For the purposes of this paper, selective attention is defined as the process of concentrating on the relevant stimuli necessary for the understanding and/or completion of the concept or task at hand. This process involves discriminating between those external and

internal irrelevant stimuli which may seek the attention of the learner at any given time, and those which are relevant to the particular learning situation. Ideally, the student is able to suppress noises coming from other children within or outside the classroom, memories of the argument with his parents as he left for school, hunger pangs, and various other distractions, and center his thoughts on those stimuli which relate more closely to his present learning--words of direction from the teacher, supporting visual aids, and the configuration of letters to be decoded. A learner incapable of filtering out the irrelevant stimuli may suffer a seriously impaired capacity for learning, for his diffuse powers of concentration may well prove to be inadequate for the successful completion of the learning task at hand. "There is little doubt that the presence of irrelevant information interferes with children's learning, especially when children are young" (Stevenson, 1972, p. 228).

Berlyne (1970) proposes three processes related to the concept of selective attention: attention in learning, attention in remembering, and attention in performance. He suggests that they take place at different points in the learning process. Attention in learning involves the selection of the relevant stimulus at the point at which the stimulus-response association is being introduced.

For example, the teacher is presenting the word "was." She writes the word on the board, naming each letter as she writes and saying the word as she completes the writing. The child must filter out irrelevant stimuli. The color of the chalk used, the quality of the teacher's handwriting, the scraping sound of the chalk on the board, the sounds coming from another reading group in the room--a host of physical, mental and emotional distractions must be ignored. Selective attention to the configuration of each of the letters, their sequence in placement, and the sound of the decoded word enables the student to learn the word presented.

Problems arise if the child is overselective in attention and cues exclusively to the configuration of the letters or to only the sound of the word. In either case, the child will have failed to make the correct stimulus-response association. This overexclusion in attention is particularly disastrous when the stimulus attended to is irrelevant to the mastery of the concept. Given the previous example, if the child notes only that the word has three letters and is pronounced "was," each three letter word encountered thereafter may be decoded as "was" until this incorrect stimulus-response pattern is altered.

The reverse of this difficulty also exists--overinclusive

attention. A child may attend to so many irrelevant stimuli that the relevant stimulus remains undetected (Ross, 1976, p. 54). In this case as well, the child must be guided to experiences which sharpen his skill of selective attention.

Berlyne addresses attention in remembering by posing the question, "When a human being is receiving a number of stimuli, which stimuli will he be able to remember on future occasions?" (1970, p. 31). This relates so closely to attention in learning that a distinction is barely recognizable. Actually, it is moot as to whether a concept can be considered "learned" if it is not remembered.

Attention in performance involves the directing of attention to one or more stimuli and giving the correct response. Using the earlier example of the presentation of the word "was," the student may remember a game at home entitled "War" and suggest this as the pronunciation, may look at the three letters individually instead of in the correct sequence and call the word "saw," or may become distracted by any number of irrelevant stimuli. In any case, the child has failed to demonstrate effective selective attention in performance.

> If the child should also be responding to various stimuli emanating from inside his body--the pinching shoe, the growling stomach, the pressure on his lower back--the observed motor responses may well lead someone to say that this child is <u>hyperactive</u>.

> The frequently reported distractibility and hyperactivity of children with learning disabilities may thus be no more than another aspect of their problem with selective attention, a problem which, from the present point of view, may well be the source of the learning disability. (Ross, 1976, p. 42).

Verbal mediation, the use of verbal labels to point out the relationship between the stimulus and the desired response, is a technique which has proven to be effective in enhancing both selective attention and memory in older students (Ross, 1976). "Verbal labels were assumed to facilitate learning partly because they increased the child's attention to the relevant cues" (Stevenson, 1972, p. 223-224). Ross (1976) suggests that teaching a child the use of labeling may prove beneficial if he/she is developmentally ready for this technique but is not using it independently. However, if a child appears efficient in the use of selective attention, the labeling should not be introduced, as it may prove distracting to the child. This points out the necessity of careful assessment of each child's needs and abilities, and the subsequent tailoring of teaching techniques and presentations.

With regard to reading, Ross (1976) believes that selective attention is the most basic of all reading skills. Discrimination plays a major role in this selective attention.

> Selective attention involves attending to the stimulus properties which differentiate the members of important classes of objects or events. Thus, what is termed "reading readiness" involves acquisition of the habit of distinguishing printed black-and-white patterns such as letters on the basis of contours, while ignoring differences in size of the retinal image or position in the visual field. (Estes, 1970, p. 56).

A student who is untrained in the use of selective attention may progress through several trial-and-error stages in attempting to learn the members of a particular class or category of information. This is trial-and-error since there may be several characteristics which are common to certain class members but which will not prove relevant to all. Therefore, upon this realization, the student must try different sets of cues until there is sufficient information for the effective discrimination of all members of the category. Given training or guidance in selectively attending to only the most relevant stimuli, a student would be able to circumvent this trial-and-error process and thus become more efficient in his learning. He would not only learn to discriminate among members of the class as initially presented, but would also have a more rational basis for adding members to this category in the future (Estes, 1970, pp. 36-37). The necessity of such training is underscored by the realization that, if selective attention is indeed the most basic of all reading skills,

defective or retarded development at this level would limit achievement at each subsequent level (Ross, 1976, p. 154).

Is there a difference in the use of effective discrimination in good and poor readers? Research (McAnnish, 1969, Anderson and Samuels, 1970) would indicate that, in performing visual discrimination tasks such as recognition of shape and size of letters and recognition of words, poor readers are much less efficient than good readers. Poor readers are not as selective in their attention and thus examine general configuration, while good readers are able to discriminate from among various stimuli and attend to significant details. Poor readers have apparently not learned to be selective in their attention and so have not learned the thought processes necessary for effective discriminative responses (Allington, 1975, pp. 22-25). "A good reader seems to attend to the message (meaning) to be extracted from the writing, while a poor (and beginning) reader attends to the medium (letters and words) in which the material is presented." (Ross, 1976, p. 147). However, research has also shown that children who have not yet developed efficient discrimination strategies show marked progress in reading achievement when tutoring in reading is coupled with training in selective attention (Ross, 1976, p. 148).

There appears to be a developmental aspect to

selective attention, for as a child grows, his attention span not only increases, but he also becomes more effective in judging which stimuli are relevant to a particular situation and in directing his attention accordingly (Schell, 1979, p. 282). When the child is young, there is a greater problem with distractibility caused by response to irrelevant cues. Introducing new cues, whether relevant or irrelevant to the learning situation, seems to distract and confuse the young child initially, and his/her performance may suffer for a long period of time as a result. On the other hand, older children show an ability to maintain correct responses regardless of such interference (Stevenson, 1972, p. 240). It should be noted that even the youngest children are capable of selectively attending to the important aspects of a task with proper guidance (Schell, 1979, p. 283).

Ross (1976, p. 17) believes that learning-disabled children have greater difficulty in maintaining the selective attention necessary for effecting learning than do their unimpaired peers. He contends that this is a major problem for learning disabled children because they develop effective selective attention more slowly than others and so are handicapped in learning (Ross, 1976, p. 46). When asked to perform tasks which require the use of selective attention, these children are

certain to be unsuccessful. Considering the developmental nature of selective attention, one might expect these children to "catch up" with their peers. Ross (1976, pp. 46-49) cites the work of Rourke and Czudner (1972) who found that, in terms of laboratory reaction-time tasks, this is actually true. The same does not hold true for academic performance, however. "Here the child's problem persists, not because of continuing difficulties with selective attention but because successful performance in seventh grade presupposes learning in earlier grades, and this such a child did not acquire." Ross, 1976, pp. 49-50). Coupled with this is the toll which years of struggle and failure have taken on the child's self-esteem, his response to learning situations, and the expectations others hold for him. It is easy to see how such a student would continue to exhibit learning problems unless specific help is given to help overcome the effects of this early developmental lag (Ross, 1976, p. 50).

Estes (1970, p. 51) addresses the problem thusly:

> Observed rates of learning in most situations, we now realize, depend to a major extent upon habits or strategies of selective attending, seeking of information, rehearsing, and the like, and the manner in which they are organized. Individual differences in these habit systems may indirectly reflect differences in capacities, but they must also be strongly determined by variation in motivational systems and in previous opportunities to learn.

Ross, in addressing the particular problems of the learning-disabled child, noted:

> ...delayed development in the capacity to sustain selective attention creates a handicap for children who are required to learn such academic subject matter as reading. The difficulties they encounter have effects on these children's personal and social adjustment so that, when their capacity for selective attention finally develops, they are not only significantly retarded in reading but also markedly impaired in terms of these psychosocial attributes. An early matching of attention capacity to academic method and demands would thus go a long way in preventing problems and helping children learn. (Ross, 1976, p. 53).

In light of the material presented this far, it is obvious that more is involved in student attention than the mere gaze of the student at the teacher. Selective attention is necessary if efficient learning is to occur. Also clear is the concept that there will be differing levels of effective use of selective attention in any given classroom, even though the age range may be narrow, and that special techniques are needed to guide those with learning problems to greater achievement. What can be done to facilitate the development of selective attention?

Task analysis can be used as a starting point. Breaking the task down into its component parts on a continuum of increasing complexity enables a teacher to ask several important questions: What must the child attend to in order to grasp the desired concept at this level? What is the critical cue to trigger memory of

this conceptual level? What stimulus or cue will enable the student to recognize and classify other information in terms of this concept? After answering these questions, the teacher can be specific in her presentation of the stimuli which must be attended to for task mastery, and thus can more effectively guide the student in his/her learning.

Berlyne (1960) suggests certain conditions which stimulate heightened attention--novelty, complexity, uncertainty, surprisingness, conflict and change. A moderate degree of complexity has been shown to increase the level of student attention while too little or too much results in boredom or satiation respectively. Novelty and change in the method of presenting new or reviewed material tends to keep interest alive. Games can be utilized quite successfully in this regard. Learning cannot always be "fun," but interesting and creative presentations will go far toward raising the level of attention and thus may awaken an otherwise disinterested youngster.

Keele (1973) believes that alertness is a necessary component of attention. He describes alertness as involving preparation. This preparation may take the form of warning signals of imminent events or warning signals which alert the student to temporarily stop a task which may interfere with the mastery of a more

important concept (pp. 152-153). These warning signals give the student clues to appropriate responses. Students need these cues prior to an activity or during the activity when performance seems to be tenuous. A study conducted by Pick, Christy, and Frankel in 1972 (in Ross, 1976, pp. 48-49) used the performance of second-graders and sixth-graders to test the effect of prior knowledge of the relevant stimulus on response time. Their findings were to be expected--prior knowledge did serve as an aid, and the older children were able to benefit more from this prior knowledge than were the younger ones. That could lead educators to assume that, for all children, alerting cues directed toward relevant stimuli are important to all students prior to an activity or the introduction of a concept, and can be of special value to the older child in increasing his/her efficiency in learning.

There is a growing body of literature which addresses the inability of some learning disabled children to apply selective attention. Some studies have suggested that the use of verbal rehearsal strategies is successful in heightening the ability to selectively attend. Others contend that learning disabled children do not need direct instruction in verbal rehearsal, but if provided with reinforcement, they will begin to use verbal rehearsal strategies. The educator is left with the option

to choose what seems most effective for the students in his/her charge--the direct teaching of verbal rehearsal strategies or the use of reinforcers to motivate students in the use of such strategies (Hallahan, 1978, p. 235).

> The technique which begins with directing the learner's attention to appropriate featural characteristics limits the possibility of learners attending to inappropriate characteristics. The learner is not left to abstract these features alone. Attention has been focused and thereby simplified the learning task. (Allington, 1975, p. 24).

Basic to the enhancement of selective attention is the emphasis placed upon various aspects of the stimuli. Often children have difficulty with selective attention because they are unable to recognize the basis on which the discriminative stimuli differ (Stevenson, 1972, p. 224). One technique which has proven helpful in this regard is exaggeration of the differences between relevant and irrelevant stimuli so that the critical stimulus becomes more obvious. "This can be accomplished by using a series of graded steps where the critical features are at first presented in isolation and irrelevant features are added gradually (faded in)" (Ross, 1976, p. 57). This technique is easily adaptable to skills in reading or math.

Another method of heightening the differences among stimuli is to present the differences accentuated in

more than one dimension. For instance, a beginning reader having difficulty distinguishing between the letters "p" and "q" might more quickly note the difference if the letters differ in color or size as well as in direction of configuration. "When irrelevant information is redundant it may be helpful; otherwise it is a hindrance" (Stevenson, 1972, p. 230).

In the same vein, adding a motor response commensurate with the stimulus enalbes some children to learn the necessary discrimination. Such actions include tracing the letters cut from sandpaper or raised with layers of dried glue, "writing" the letter in sand, aligning a stencil over the letter, or "writing" the letter in the air or on their body. Whatever the specific method, the addition of the motor response is helpful for many youngsters, for it helps the child to focus all the more intently on the visual stimulus (Ross, 1976, p. 57).

Ross (1976) cites research which illustrates that young children can be trained to differentiate between stimuli by matching a transparent copy of the stimulus over both an identical and a different letter and asking the child whether these are the same or different. The teacher first models the procedure, saying the correct answer and explaining its correctness. This demonstration technique enhances the child's success in learning

the discrimination (Ross, 1976, p. 58).

There are instances when reinforcers are useful in the development of selective attention.

> For older children this need be no more than knowledge of results; but for younger children a more concrete reward appears to be necessary. The function of a reward in such a situation may be both motivational (keeping the child at a dull task) and informational (providing feedback as to response accuracy). (Ross, 1976, p. 58).

The use of extrinsic reinforcers aids in the development of selective attention. This technique is particularly helpful with remedical readers, for they must work so hard and generally receive so little intrinsic reward for their efforts. Obviously, the teacher must be careful to choose a reinforcer which is gratifying to the child. Positive reinforcers include praise, free time, treats, and recreation.

While not discarding the construct of the developmental nature of selective attention, recent research has dealt with the role of the child as an active agent in the learning process. The belief has been advanced that "appropriate selectivity in any given situation is a function of the subject's active manipulation of his attention in response to felt demands of the situation" (Torgesen, 1977, p. 28). This would speak especially to the learning disabled child who is more reticent to initiate a learning task and who may not have developed

an effective learning strategy. "...the learning disabled child's external view of the world may hinder him from actively seeking appropriate learning strategies" (Hallahan, 1978, p. 51).

As Hallahan (1978, p. 235) further paraphrased:

> ...we should point out that the combined results of our studies on selective attention...support the position of the learning disabled child as an inactive learner (Torgesen, 1977). It may prove beneficial for teachers to use techniques such as reinforcement, direct teacher instructions, modeling and self-instructional training. (Meichenbaum, 1977).

In summary, it is apparent that a teacher must be aware of Berlyne's (1970) three processes noted earlier: learning, remembering, and performing. Information must be conveyed in a manner interesting and acceptable to the child with relevant cues for concept formation. Retention must be tested and insured, and an opportunity for successful performance must be offered. This would seem particularly important for the learning disabled child, since failure to develop and cultivate selective attention essentially insures life-long educational difficulty and the corresponding social and emotional problems inherent in this. Perhaps if more learning disabled children could be provided this critical tool earlier in their education, there would be significantly less stigma attached to the disorder, and instruction in later years could be more efficacious.

The ability to maintain selective attention would appear to be a prerequisite for effective and efficient student learning. In addition, knowledge of the importance of selective attention and ways to maximize it would appear to be a prerequisite for effective teaching.

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